



MONTGOMERY WATSON

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SEP 03 1996

August 30, 1996

McDonnell Douglas Realty Company
4060 Lakewood Blvd., 6th Floor
Long Beach, CA 90808-1700

Attention: Mr. S. Mario Stavale

Dear Mario:

This letter responds to your request for additional information related to our revised approach for the Building 36 plume at the Douglas Aircraft Company C-6 facility in Torrance, California. At this time, our suggested approach is a departure from the initially proposed "complete removal" program. Alternatively, we are suggesting a change to "risk evaluation and source suppression/perimeter monitoring" as the most reasonable approach to protect human health and the environment and to meet the needs of McDonnell Douglas Realty Company (MDRC).

HISTORY OF RELEVANT EVENTS

- 1989 Woodward Clyde Consultants evaluated hydrogeological conditions.
- 1991 Solvent tanks were removed from the Building 36 area.
- 1992 Montgomery Watson conducted a feasibility study based on aquifer property data collected by previous investigators.
- 1993 Montgomery Watson conducted a soil-only pilot test to evaluate vapor extraction as a remediation tool.
- 1993 Del Amo Superfund Site Phase I Remedial Investigation report published.
- 1993 Montgomery Watson began design of the remediation system.
- 1994 Montgomery Watson reached 95% design completion and stopped work pending review of the feasibility study by the Los Angeles Regional Water Quality Control Board (RWQCB).

CHANGE IN APPROACH

In general, our change in approach for the Building 36 plume is based on the following significant events that occurred after the initial hydrogeological investigation was conducted in 1989 (published in 1990):

- The accumulation of seven years of groundwater quality data at the C-6 facility.
- The accumulation of voluminous subsurface data from the neighboring Del Amo and Montrose Superfund sites.

- The emerging minimalistic actions for protecting human health and the environment at the neighboring Del Amo Site and the current reception of these actions by regulatory authorities.
- The changing regulatory climate.
- The decision of Douglas Aircraft Company to divest the C-6 facility property.

Specifically, our suggested change in approach is based on the following.

(1) The Big Picture

The C-6 facility is located adjacent to two National Priority List Superfund sites — Del Amo Site and Montrose Chemical. The Building 36 plume pales in comparison to soil and groundwater impact at these Superfund sites. However, risk to human health and the environment at the Del Amo Site has been evaluated by the Respondents and is acceptable. As a tiny player in this regional ballpark, MDRC may wish to consider maintaining a reactive, “follower” position rather than launching into an aggressive removal program that may not ultimately be required at the larger Superfund sites. Additionally, as the C-6 facility is prepared for divestiture, establishing precedence with the RWQCB for source suppression/perimeter monitoring only may become important in promoting redevelopment of the property should additional pockets of environmental concern be discovered.

(2) Future Land Use

Source suppression/perimeter monitoring are attractive response actions when the following conditions are present:

- a) The site has a long history of industrial usage.
- b) A change in land use (e.g., industrial to residential) is not expected in the near future.
- c) The cost of remediating affected soil and groundwater to promulgated standards is high.
- d) Actual risk to human health from present site conditions is acceptable.

The C-6 facility appears to meet these conditions and promoting this concept to the RWQCB is reasonable.

(3) Stable Leading Edge Concentrations

Monitoring well WCC-9S is the most down-gradient sampling location within the Building 36 plume study area. The major constituent of concern at this well since sampling began in 1989 has been TCE. During the most recent sampling event (June 1996), the concentration of TCE was 15 µg/L which is identical to the concentration reported during the first sampling round (October 1989). Over the seven year period (19 sampling episodes), the reported concentration of TCE has experienced minor fluctuation, reaching a maximum of only 64 µg/L in 1995. (In fact, other down-gradient monitoring wells have shown general decline in major constituent concentrations over this time period.)

The empirical data indicate that the concentration of TCE has not appreciably changed over time at the leading edge of the plume. Natural attenuation factors are logically responsible since no active remediation system is in-place. In short, there appears to be no net plume movement in the horizontal direction. Under these conditions, a pump-and-treat system along the perimeter to contain movement of the plume does not seem warranted. Thus, a monitoring only position is recommended.

(4) No NAPL

Non-aqueous phase liquids (i.e., separate phase, or "NAPL") are present at the Del Amo Site and Montrose Chemical Site. NAPL is currently being removed by pumping at the Del Amo Site. The Del Amo Site Respondents have been successful to date in convincing U.S. EPA that pump-and-treat of dissolved-phase groundwater is impractical based on the low permeability formations.

Data we reviewed suggest that NAPL is not present at the C-6 facility and only dissolved-phase contaminants are present. To proceed on a pump-and-treat program at this time to contain/remove dissolved-phase contaminants would not be in parity with adjacent Superfund site approaches and may be an inequity to MDRC in the long-run if this course of action is not required at the Del Amo or Montrose sites.

(5) Absence of Enforcement

Douglas Aircraft Company has been proactive in managing the Building 36 plume. The Regional Water Quality Control Board (RWQCB) has not issued an enforcement order and has been generally passive in their attention to this matter. The Building 36 plume does not appear to be of major concern to the RWQCB, particularly in light of the more serious environmental problems at adjacent properties. Consequently, we suggest a minimalistic approach should be pursued with the RWQCB commensurate with the limited attention given by the RWQCB.

(6) Changing Regulatory Climate

In our experience, the regulatory climate has changed over the last seven years and has become more cooperative with industry to meet the objectives of society as a whole. In particular, the following areas of change have been apparent:

- a) The RWQCB has become more receptive to accepting health-based risk assessments as a means of determining appropriate cleanup levels. RWQCB staff have expressed their desire to provide approval in the data acquisition process to ensure that the regulated community performs an evaluation that will be accepted. A risk evaluation to determine the necessity of remediating the Building 36 plume to protect human health and the environment should be considered.
- b) RWQCB staff have remarked that their intention is work with industry to promote redevelopment of property. Such cooperation may entail delaying or altering a remedial approach to coincide with redevelopment activities.
- c) RWQCB staff are aware of the technical and economic difficulties of removing dissolved-phase chlorinated solvents from groundwater (i.e., aquifer restoration). At other similar sites, our experience is that RWQCB staff are most interested in source suppression at the "hot spot" and frequently limit remediation activities to this course of action. (Well-head treatment at a drinking water well is often considered the only practical solution should dissolved-phase constituents migrate to a drinking water well.) As such, the RWQCB may be amenable to a limited treatment action at the source location only, and monitoring of the dissolved constituents over time. [Note that this approach will be less costly and occupy less physical space, which should be more conducive to redevelopment of the property.]

Although future regulatory uncertainties are a challenge in any redevelopment process, we are optimistic that MDRC and the RWQCB can negotiate a mutually beneficial alternative program for the Building 36 plume and the remainder of the C-6 facility.

GROUNDWATER VELOCITY DISCREPANCIES

Groundwater velocity data reported at the C-6 facility differs significantly from that initially reported at the Del Amo Site. A review of the relevant hydrostratigraphy and data collection techniques will help explain the differences.

Del Amo Site Investigation

An exhaustive subsurface delineation program has been implemented at the Del Amo Site.

The following sampling points have been installed within the Water Table Zone in the Upper Bellflower Aquitard: 37 well points, 26 piezometers, and 13 monitoring wells (maximum depth 78 feet). Six monitoring wells have been installed in the Middle Bellflower Zone (maximum depth 150 feet). In addition, 24 soil borings were advanced to depths between 150 and 250 feet. Subsurface information was collected in these soil borings using the following techniques:

- Lithologic boring logs
- Geophysical logs (natural gamma, spontaneous potential, caliper, guard resistivity, point resistivity, 16- and 24-inch normal resistivity, and acoustic logs for selected borings)
- Continuous lithologic core
- 100+ soil samples from the depths of 30 to 250 feet collected for physical property analysis (porosity, horizontal/vertical permeability, hydraulic conductivity, bulk density, moisture content, grain size distribution, Atterburg limits)

Hydrostratigraphic Correlation

Based on our knowledge of the local subsurface conditions, the "shallow zone" at the C-6 facility should correlate with the "middle Bellflower sand" at the Del Amo Site.

Velocity Calculations

At the C-6 facility, a single 16-hour aquifer pump test was performed in 1989 to evaluate aquifer properties in the "shallow zone". The data collected were used to determine an average linear groundwater velocity of 234 ft/year at a gradient of 0.002 ft/ft.

At the Del Amo Site, extensive laboratory test data from soil samples were used to determine an average linear velocity in the "middle Bellflower sand" of 1.1 ft/year under a gradient of 0.001 ft/ft.

Pump testing has been performed at the Del Amo Site and only limited data became available to us yesterday. Using hydraulic conductivity values obtained from the "middle Bellflower sand" and the 0.002 ft/ft gradient reported at the C-6 facility, an average linear groundwater velocity can be calculated at 86 ft/year.

Summary

Aquifer properties in the study area, such as hydraulic conductivity and effective porosity, vary locally with the heterogeneities of the sediments. Consequently, groundwater velocity calculations will differ based on the methods of data collection and analysis. Order of magnitude differences are common and must be considered when interpreting groundwater velocity calculations. Generally, in situ pump test data are considered more reliable than laboratory-derived data.

The new pump test data from the Del Amo Site tends to corroborate the C-6 facility calculations suggesting that average groundwater velocity in the "shallow zone" on the order of 200 ft/year may be possible. Regardless of velocity, the empirical groundwater quality data at the C-6 facility, and the Del Amo Site, suggest that net horizontal dissolved-phase plume movement is negligible. Since no active remediation systems are in-place at either site, the effects of natural attenuation factors acting on the chemicals of concern must therefore be more important in limiting lateral migration than groundwater velocity.

Please call if you have any questions or require additional information.

Sincerely,

MONTGOMERY WATSON



M. Fred Strauss, R.G.
Principal Hydrogeologist

cc: D. Earle